# Physics 112
# Quiz #20
# November 10, 2000

**Name: _____**

***IF YOU WANT A QUESTION GRADED OUT OF THREE POINTS (–1 [MINUS ONE] FOR WRONG ANSWER!!) WRITE "3" IN SPACE PROVIDED ON EACH QUESTION.***

1. A galvanometer is connected to a large solenoidal coil. ***Inside*** that coil is another, smaller coil (aligned along the same axis as the larger coil), connected to a battery through an open switch. The switch is suddenly closed, completing the circuit and connecting the small coil to the battery; the switch remains closed permanently. What will you observe on the galvanometer?
   A. No deflection.
   B. Needle will suddenly deflect, and stay steady at some non-zero value.
   C. Needle will slowly rise to some non-zero value, and remain there.
   D. Needle will steadily deflect to larger and larger values.
   E. Needle will suddenly deflect, and then rapidly drop back to zero.
   F. Needle will deflect to one side, and then deflect sharply to the ***opposite*** side.

   ***Grade out of 3? Write "3" here: _____***

2. A battery connected to two identical bulbs in parallel supplies 3 W of power. If the bulbs are connected in *series* to the same battery, what power will the battery now have to supply? *Hint: Consider what happens to the* ***total current*** *through the battery.*
   A. ¾ W
   B. 3/2 W
   C. 3 W
   D. 6 W
   E. 12 W

3. A square loop of wire, 2 m on each side, is sitting in the xy plane. A 3-T magnetic field points in the z direction. The loop is then turned upside down over a period of 2 seconds. (The loop is "flipped over" so that it is still in the xy plane but the current now flows in the opposite direction.) If the resistance of the loop is 8 ohms, what is the average amount of current that flows in the loop while it is turning? *Hint: Consider the change in cos* $\theta$
   A. 0.75 A
   B. 1.0 A
   C. 1.5 A
   D. 3.0 A
   E. 4.5 A
   F. 6.0 A
   G. 9.0 A

   ***Grade out of 3? Write "3" here: _____***

4. A wire loop carrying a current is found to be strongly attracted to a bar magnet. This comes about because:

   A. there is a uniform magnetic field produced by the magnet which creates a torque on the current loop

   B. there is a nonuniform magnetic field produced by the magnet which results in a net force on the current loop

   C. the electrical field produced by the magnet attracts charges in the wire loop

   D. the electrical field produced by the magnet attracts the current in the wire loop

   E. the gravitational field produced by the magnet attracts the wire loop